

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 35185-PCT	<b>FOR FURTHER ACTION</b>	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US03/25972	International filing date ( <i>day/month/year</i> ) 19 August 2003 (19.08.2003)	(Earliest) Priority Date ( <i>day/month/year</i> ) 19 August 2002 (19.08.2002)
Applicant THE TRUSTEES OF COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the Report**

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

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the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐

contained in the international application in written form.

☐

filed together with the international application in computer readable form.

☐

furnished subsequently to this Authority in written form.

☐

furnished subsequently to this Authority in computer readable form.

☐

the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐

the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (See Box II).

4. With regard to the **title**,

☒

the text is approved as submitted by the applicant.

☐

the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☐

the text is approved as submitted by the applicant.

☒

the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 1 A

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as suggested by the applicant.

☐

because the applicant failed to suggest a figure.

☒

because this figure better characterizes the invention.

☐

None of the figures

**Box III TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)****NEW ABSTRACT**

A process and system for processing a thin film sample, as well as the thin film structure are provided. In particular, a beam generator (110) can be controlled (100) to emit successive irradiation beam pulses (164) at a predetermined repetition rate. Each irradiation beam pulse may be masked to define a first plurality of beamlets and a second plurality of beamlets. The first and second plurality of beamlets of each of the irradiation pulses being provided for impinging the film sample (170) and having an intensity which is sufficient to at least partially melt irradiated portions of the section of the film sample. A particular portion of the section of the film sample is irradiated with the first beamlets of a first pulse of the irradiated beam pulses to melt first areas of the particular portion, the first areas being at least partially melted, leaving first unirradiated regions between respective adjacent ones of the first areas, and being allowed to resolidify and crystallize. After the irradiation of the particular portion with the first beamlets, the particular portion is again irradiated with the second beamlets of a second pulse of the irradiated beam pulses to melt second areas of the particular portion, the second areas being at least partially melted, leaving second unirradiated regions between respective adjacent one of the second areas, and being allowed to resolidify and crystallize. The first irradiated areas and the second irradiated areas are intermingled with in another within the section of the film sample.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25972

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : C 30 B 13/06, 13/16, 13/22, 13/24, 13/28, 13/30

US CL : 117/46, 47, 43, 44, 904

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 117/46, 47, 43, 44, 904

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST: search terms; laser, crystal, scan, beams

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,691,983 A (KOBAYASHI et al.) 08 September 1987 (08.09.1987).	1-65
A	US 5,304,357 A (SATO et al.) 19 April 1994 (19.04.1994).	1-65
A	US 5,591,668 A (MAEGAWA et al.) 07 January 1997 (07.01.1997).	1-65
A	US 6,368,945 B1 (IM) 09 April 2002 (09.04.2002).	1-65
A	US 2001/0041,426 A1 (IM) 15 November 2001 (15.11.2001).	1-65

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;"

document member of the same patent family

Date of the actual completion of the international search

09 February 2004 (09.02.2004)

Date of mailing of the international search report

01 MAR 2004

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